1931

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VEGETABLE GROWERS NEWS LETTER
Issued by
The Maryland Vegetable Growers Association
W. R. Ballard, Secretary-Treasurer.

Vol. VIII. No. 1. College Park, Maryland. January 1931

The Annual Meetings

In the two morning sessions held by the Association, six interesting papers were presented. An effort is being made to get these published at an early date so that the members may have the detailed information contained in them.

Dr. F. W. Geise, now with the American Can Company, presented the latest methods for "Production of Spinach for Market and Canning."

Unfortunately, Dr. V. R. Boswell, of the U.S.D.A. was called away unexpectedly at the last minute and was not able to present the subject of "Standardizing Vegetable Varieties". Mr. T. H. White was good enough to "pinch-hit" for him and suggested the need for such work and some of the difficulties attending it.

Mr. J. B. Edmonds outlined the methods used in Michigan in the production of cantaloupes. Due to scarcity of manure, growers are making greater use of commercial fertilizers. The formula recommended contains 3-4% nitrogen 12-16% superphosphate and 4-6% potash applied in hills at the rate of 300-400 pounds.

The honey bee was found to be very important in securing cross-pollination.

Dr. Jehle reviewed the importance of disease free sweet potato stock and the steps necessary to secure certification.

Dr. H. A. Spillman brought out several points of interest regarding the "Regulatory Work of the U.S.D.A. as Related to Fruits and Vegetables". It does not seem to be generally known that cooperative organizations or even partnerships handling produce in carload lots in interstate traffic are required to obtain a Federal License before they can do business. Dr. Spillman suggested that in case of doubt, application be made to his office for a ruling.

In discussing "Competition in the Vegetable Industry", Ralph Russell reviewed the changing conditions of production and distribution and its effect on Maryland growers.

The Potato Exhibit

The first attempt to hold a potato show in connection with the annual meeting was not particularly successful. However, a large display was not expected because of the poor season and the late date on which the exhibit was planned. One shipment from Garrett county was lost. Had this arrived in time it would have augmented the entries considerably. As it was the following prizes were awarded.

Cobblers

1st. W. A. Ward, Pocomoke
2nd. Clay Pilchard, Pocomoke
3rd. Herbert Pilchard, Pocomoke

Sweet Potatoes

1st. Wm. P. Hotton, Salisbury
2nd. Frank Hotton, Salisbury
3rd. Cecil Hotton, Salisbury

The matter of fostering a State Show was taken up with the Executive Board and with their approval tentative plans have been worked out for three district exhibits, the prize winning exhibits from which will be eligible for entry in the State Show. Prize winners at the State Show will be expected to join the Vegetable Growers Association in return for the advertisement which will be given of available certified seed stocks.

Canners and Field Men's School

A program of the school which is to be held at the University on Tuesday and Wednesday, February 3-4, 1931 is being sent each member. This conference to study factors relating to canning crops has become an annual affair and is of interest to both canner and grower.

McCormick and Jersey Redskin

These two varieties represent a type of potato capable of standing higher temperatures than the majority of commercial varieties. Their value lies in their productiveness and the fact that they can be carried over from one year to the next in ordinary storage. They are, therefore, of particular importance for the grower who does not produce potatoes commercially. These are varieties requiring a long season for development and consequently northern sections can not be depended upon to supply seed stock. They seem quite susceptible to virus diseases and the only hope of maintaining these varieties for Maryland growers is to produce seed stock in the State. An attempt is being made to do this but very careful work will be required to develop and maintain a stock with a minimum amount of disease.

Dry Beans

For two years the summers have been dry and some growers in casting about for cash crops have been successful in growing dry beans, One should not be mislead by unusual conditions and launch out on a large scale on crops which are not adapted to normal conditions. Notwithstanding the fact that a few growers in some sections of the State raise dry beans annually, it is hard to see how growers can compete commercially with growers in dry sections. The returns are such as not to warrant the expensive removal of weather damaged beans which so often accompany the harvesting of this crop in Maryland.

VEGETABLE GROWERS NEWS LATTER
Issued by
The Maryland Vegetable Growers Association
W. R. Ballard, Secretary-Treasurer.

Vol.VIII. No.2 February, 1931.

Promising Potato Tests

Wm. H. Martin of the New Jersey Experiment Station has reported on 5 years' results with various disinfectants mixed with fertilizers and applied in the furrow in the usual manner. The purpose of the experiments was to note the effect of disinfectants on the development of scab and other diseases of potatoes. The following table will repay careful study.

	Yield bu.per A.	Percentage free from Scab:	Severe Rhizoctonia
Fertilizer alone	143.3	65.8	51.7
Fertilizer & 20 lbs. calomel	176.00	93.9	2.7
Fertilizer & 10 lbs. oxide of mercury	147.9	97.4	3.1
Fertilizer & 45. lbs. Semesan	170.7	93.7	1.8

It is probably true that potatoes would yield more heavily on neutral or slightly alkaline soil if the soil borne diseases could be controlled without keeping the soil acid. These experiments seem to lead the way and work will be conducted in Maryland to determine the practicability of the method in the potato growing sections of the State.

Publications

Circular No. 135 of the Pennsylvania State College, "Growing Early Vegetable plants Under Glass" discusses the plant house, coldframes, transplanting, etc. Bulletin No. 103 of the Ohio Extension Service, Columbus, Ohio, covers a similar field.

The Wisconsin Experiment Station has just issued Research Bulletin No. 101 - "Origin and Nature of Rogues in Canning Peas." The author, E. J. Renard, finds that in addition to mechanical mixtures, natural crossing is responsible for the development of a wide range of variations. Crossing may take place in the field before rogueing takes place and thus tends to continue the impurities. Many of these cross-bred plants have high yielding capacity so that a relatively few plants of off-types may bring about a rapid deterioration of a stock.

The Paper Mulch Again

The Ohio Experiment Station has reported in bulletin No. 447 results of using "Paper Mulch for the Vegetable Garden." These tests indicate that papers sold or recommended are not all equally valuable. It did not seem practical to use papers where it was necessary to walk upon them. The best of the papers would probably have lasted a second season, but became too brittle to take up and relay. While most of the vegetables tried, responded favorably to the use of black mulching papers, the percentage increases were not as large as most of those

reported in the literature of the paper companies. The paper mulch seems better adapted to the warm season crops. While moisture is undoubtedly conserved during dry seasons, excessive rains especially early in the year may keep the ground saturated for a period of several weeks.

The Home Vegetable Garden

Because of the depression, more attention will undoubtedly be given to the home vegetable garden during 1931, as a means of helping out the family income. The Red Cross is planning to furnish free seeds to worthy families who are not able to buy stock. As an emergency measure this will no doubt give some measure of relief. Under normal conditions, however, it is a question whether the attempt to bring back the old fashioned home garden can succeed. The whole tendency is toward mass production of vegetables and this trend is based upon the economics. A vegetable garden designed to furnish the average-sized family with all the vegetables needed for the year presents a problem in management more intricate than that of managing a large farm. On the small farm where the family supplies the labor this can be made a profitable venture. There are, however, limitations of soil and climate difficult to be overcome.

Extension Service Bulletin No. 34 "More Vegetables From the Home Garden" is a valuable guide to those who are unfamiliar with Maryland conditions.

More Asparagus

Maryland Crop production figures for 1929 and 1930 shows that asparagus a considerably higher value per acre than all other truck and canning crops. Conditions and market demands would seem to justify an increased acreage of asparagus especially on the deep sandy loams of the Eastern Shore. The Mary Washington variety is recommended because of high quality and its resistance to rust. The preferred distances for planting are 2 feet apart in rows 5 feet apart. A suitable fertilizer mixture is 500 lbs. nitrate of soda, 200 lbs. superphosphate and 500 lbs. kainit per acre. Avoid the use of ammonium sulphate on this crop, but if a commercial mixture is to be used, a 7-6-5 will be suitable provided lime is used to counteract acidity.

During the cutting season keep everything cut clean. Do not allow volunteer plants to grow because they carry over the early stages of the rust. New beds must be sprayed carefully to control rust. Spraying with a 4-5-50 bordeaux with 1½ lbs. arsenate of lead to 50 gallons or dusting with a 20-20-60 copper-arsenate-lime dust is essential to control insect pests.

VEGETABLE GROWERS NEWS LETTER
Issued by
The Maryland Vegetable Growers Association
W. R. Ballard, Secretary-Treasurer.

VOL. VIII. No. 3. College Park, Md. March, 1931

Sweet Potato Prospects

The outlook for this crop in the principal producing areas of the United States, is for a larger production in 1931. This is particularly true of the cotton belt where the low price of cotton usually presages increased acreages of sweet potatoes. With this prospect in view, it would seem wise for Maryland growers to use the best seed and the most up-to-date methods to increase yields per acre on an economic basis. Because of the effect on yield and keeping qualities, of the prevalent diseases, it would seem to be particularly important to use certified seed stock. Such stock is somewhat limited in this State but rules of the Certification Board are quite strict thus making the certified seed stock of more value. It is hoped to greatly increase stocks of this high - grade seed potatoes in Maryland and the M.V.G.A. hopes to stimulate this development through shows held in connection with the annual meetings.

Canner's School Report

Because of its general interest, a copy of the report of the Canner's School recently held at the University of Maryland is being sent to you under separate cover.

REPORT

of

CANNERS' AND FIELD MEN'S SCHOOL

Held Under the Auspices of the College of Agriculture
and Agricultural Extension Division of the
University of Maryland in Cooperation with
the Tri-State Packers' Association

February 3rd and 4th, 1931

at

College Park, Maryland

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REPORT

of

CANNERS' AND FIELD MEN'S SCHOOL

February 3rd and 4th, 1931

College Park, Maryland

OPENING ADDRESS

Looking at the Industry

by

E. I. Oswald, University of Maryland

The drought conditions of 1930 were particularly unfavorable for the production of canning crops in Maryland. The drought surpassed all previous records for severity, duration, and extent of territory included. The State as a whole received only a little more than one-half of the usual rainfall for the year, and this condition was coupled with extended periods of excessively high temperatures during the growing season. The following tabulation gives a general idea of the small amount of rainfall received and its comparison with normal seasons:

Total Precipitation in Maryland in 1930 by Months and Percentage of the Normal

	Amount Received	Percent of Normal		Amount Received	Percent of Normal
January	2.67 in.	79%	July	1.41 in.	33%
February	2.06 "	69	August	1.06 "	26
March	2.16 "	60	September	1.31 "	40
April	2.54 "	76	October	0.74 "	26
May	2.11 "	59	November	1.19 "	48
June	3.36 "	85	December	2.68 "	82
			YEAR - - - -	23.29 "	56

The State received approximately 70 percent of its usual rainfall during the first half of the year and about 40 percent during the last half. There was only one-third of the normal rainfall during the months of July, August, September and October. In brief, it may be said that the entire State of Maryland was seriously affected by the drought and, with the exception of a few small sections, the damage was very severe.

A study of the statistics for the production of raw products and the pack of canned vegetables in the Tri-State territory shows that this is one of the important agricultural industries of the section. The following figures give the estimated averages for the years 1926 through 1929 of the production and pack with the values for each:

Production and Value of Raw Products
Tri-State Territory - (1926-1929)

	Production (tons)	Farm Value
Snap beans	6,300	$ 348,000
Sweet corn	64,050	869,750
Spinach	4,050	137,750
Peas	13,107	794,250
Tomatoes	322,855	5,544,500
Lima beans	6,225	498,100
Total	416,587	$ 8,192,350

Pack and Value of Canned Vegetables
Tri-State Territory - (1926-1929)

	Cases No. 2's	Value
Snap beans	1,260,544	$ 2,521,088
Sweet corn	1,972,079	3,599,544
Peas	1,339,954	2,459,138
Tomatoes	6,245,048	10,234,618
Lima beans	622,400	2,053,920
Beets	99,661	239,186
Total	11,539,686	$ 21,107,494

SOILS AND FERTILIZERS. Chairman, Ralph O. Dulany, Fruitland, Maryland.

Fertilizer Requirements of Canning Crops Soils in the Tri-State Sections

by

Dr. R. P. Thomas, University of Maryland

One of the principal factors for consideration in determining the fertilizer requirements of a soil is the soil itself. Soil is formed by the breaking down of rocks and minerals by weathering with the addition of varying amounts of organic materials. The Coastal Plain soils are made up of materials deposited in layers under water.

The Coastal Plain soils of the Tri-State canning crops areas are made up principally of the following series: Collington, Sassafras, Keyport, Norfolk and Elkton.

The manner in which these soils were formed indicates that they may be classified as relatively unproductive. The supply of organic matter is low, and as there is a direct relation between organic matter and nitrogen content they are also deficient in their supply of nitrogen. They are low in practically all of the plant food constituents with the possible exception of potash. Their mode of formation and period of weathering have made them naturally poor in the beginning. They have, however, with the possible exception of the Elkton and Portsmouth series, good physical characteristics. This makes them capable of being brought to a high plane of productive capacity when properly managed. This necessitates great care in bringing up and maintaining a high level of productivity in the soil by the use of fertilizing materials. If these materials were listed in order of their need, they would probably appear as follows: phosphorus, nitrogen, potassium, calcium, magnesium and manganese.

Fertilizers are reported by the analysis, such as 2-8-5, 4-10-4, etc. The first figure means the percent of nitrogen, the second the percent of phosphoric acid, and the last the percent of potassium oxide or potash. The following nitrogen materials are given in about the order of their use in commercial fertilizers: inorganic forms - sulfate of ammonia, ammoniated phosphates and nitrates; organic forms - urea, cyanamid, tankage, fish, cottonseed meal and dried blood. There is more and more inorganic nitrogen being used each year. In the past two years this increase has been largely in the ammoniated phosphates. Superphosphate and the ammoniated phosphates are about the only forms of phosphorus used in mixed fertilizers in this section. There are a number of potash-bearing salts used as fertilizers but the principal ones are the sulfate and chloride, commonly called muriate. Superphosphate is often applied by itself, and the nitrates and sulfates of ammonia are frequently used separately as side dressings.

The organic nitrogen materials, with the possible exception of urea, cannot be used by the plant in the form in which they are applied. They have to be changed by the soil organisms first into the ammonia and finally into the nitrate form. The nitrates are the most available of any of the nitrogen forms, but unfortunately they are also very soluble and are easily lost from the soil by leaching. This prevents the farmer from building up a reserve of nitrogen in the soil unless large amounts of organic matter are incorporated along with the nitrogen. The organisms which decompose the organic matter remove the nitrogen from the soil solution and assimilate it in their bodies. In this manner the nitrogen is prevented from being lost by leaching and remains in the soil in this organic form until slowly made available.

The phosphate materials do not remain long in the form in which they are applied to the soil, but react with other soil materials to form compounds which seem to be less soluble than the superphosphates. Very little phosphorus is lost by leaching. This fixation and absorption of the phosphates by other substances in the soil make the amount needed for a crop much greater than would be necessary if all of it remained water soluble. Phosphorus studies also suggest that if we are to build up a reserve, or supply enough phosphorus to meet all soil demands, it must be applied in amounts sufficient to meet the demands of these other materials which fix it and still have an excess for the plant use. Recent work indicates that the problem may be met to some extent either by supplying the phosphorus in a form in which the solubility is so low that there is not enough brought into solution to react with the substances which fix it or by applying it in bands or clumps as is done in row or hill applications.

The potassium salts are rather rapidly absorbed from the soil solution. The element potassium displaces other elements in compounds in the soil, and the potassium in this new form may or may not be available for plant use. Part of that which is locked up becomes slowly available when acted upon by soil acids. If a large amount of potash is supplied to the soil, it is possible to build up a reserve to the point where further addition of a potash fertilizer only tends to displace other elements, such as calcium, magnesium and manganese.

From the origin and mode of formation of the Coastal Plain soils it would be expected that they would be deficient in lime, and most of these soils do need lime in some form or other. The aim in liming should be to establish an equilibrium between acidity and alkalinity. It is not wise to displace all

of the acidity by applying an excess of lime or to allow the acidity to become too great. A slightly acid soil has more available fertility than a neutral or alkaline soil. Inasmuch as most of the Coastal Plain soils are deficient in magnesium it would probably be well to apply a dolomitc limestone to supply this element.

The requirements of the plant for the fertilizer materia s should be considered in determining the type of fertilizer to apply. If leaf and stalk growth is desired, a large amount of nitrogen should be applied in proportion to the other elements. If fruit is desired, phosphorus is the most important element with potash and nitrogen next in order. If the roots are the important part of the plant, as in the case of beets, then phosphorus also is an important element. In some of the root crops, however, potassium is equally important. For canning crops such as sweet corn, tomatoes, peas, beans, phosphorus is the most needed element and should be contained in the largest amounts in the fertilizer mixture. Probably the best proportion would be to have more phosphoric acid in the mixture than nitrogen and potash together. For crops such as spinach and cabbage, in which the leafy material is desired, nitrogen should be supplied in amounts higher than for the fruit crops. The soils in this section are so low in phosphorus, however, that it seems more economical to use a mixture in which there is more phosphorus than nitrogen and in which the nitrogen and potash units are nearly the same.

Any fertilizer recommendation is influenced noticeably by the previous treatment of the soil. If large amounts of crop residue have been turned under for several years it is probably that the amount of nitrogen applied in the commercial fertilizer could be cut down considerably. Such treatment with manure and organic matter would also affect the potash to a certain extent. If there has been a heavy application of manure for some time the amount of potash under normal circumstances can be considerably decreased. If heavy applications of fertilizers high in potash have been used for a number of years probably the amount of potash required in the mixture at this time can be decreased. The fertilizer needs will be influenced also by the rotation and system of farming and by the soil type. The coarser textured soils leach more rapidly than the silts and clays and this necessitates that greater amounts of plant food be supplied.

Of the Coastal Plain soils, the Sassafras types are the most suitable for cropping in the Delaware, Maryland and Virginia peninsula. The Collington is the best in the New Jersey section. Phosphorus is the most needed element in the Sassafras soils. The sandier types of this series require more potash and nitrogen than the heavier types. In general, all of the lighter textured soils such as sands and sandy loams are lower in their fertility, need more fertilizer, and are harder to maintain in a good state of fertility. The Keyport soils are similar to the Sassafras series. The Elkton soils are handicapped by a high water table. Their fertilizer needs are similar to those of the Sassafras soils, and they could be brought to as high a state of fertility if it were not for the high water level. The Norfolk soils are in the lowest plane of fertility, but may be made to produce satisfactory crops by the application of large amounts of fertilizers. Nitrogen is probably more needed on these soils than on the others.

For the most economical gains the farmer should adopt a long-time program for his soils. He should keep in mind the fact that he has a soil which, if not properly managed, will deplete itself rapidly but which can be maintained in a good state of productivity. The fertilizer analysis and recommendations may vary from time to time, depending upon crop prices and upon economic conditions which affect fertilizer mixtures and prices.

Field Tests for Plant Food Definciencies

by

Dr. A. L. Whiting, Urbana Laboratories, Urbana, Illinois

The fact that soils vary widely in fertility, even within the same field, can be seen at a glance, but the cause of the variation cannot always be determined even by complete chemical tests. As a rule the most productive soils contain a considerable quantity of limestone, but the fertility of a field cannot be judged by one element alone. Drainage is one of the factors which rarely receives sufficient consideration.

A simple soil test to show the amount of lime present in a soil was devised in England twelve years ago and the principle of this test has been used in a number of foreign countries and in 38 states in this country with very good results. Other field tests have been devised to show the relative presence or deficiencies of phosphorus, potash and nitrogen. These tests may not be absolutely accurate under all conditions but have been standardized for general farming systems.

The lime and phosphorus tests have received most attention and probably give the most important information of the soil condition. These tests are applied directly to soil samples. In taking the samples for tests great care should be exercised to secure them from representative portions of the fields. Owing to the variation within given fields, samples should be taken from all representative parts. Sufficient samples should be taken to give a true indication of the soil condition. Definite plans may be obtained which show in detail the method of taking soil samples. It is desirable to chart the location of each sample, so that a permanent record may be kept of the field. At least six samples should be taken from a ten-acre field which is fairly uniform. If the soil is uniform throughout, all samples may be mixed together and one test made of the mixture. If the soil is not so uniform, it is well to test each sample separately.

An advantage of keeping the samples separate and charting the location of each, is to be able to give a particular part of a field the treatment that it needs. One portion of a field may not need any lime, while another portion of the same field may need a large quantity. The same is true in relation to the other materials.

In taking the samples, the top layer of soil to a depth of about one inch should be pushed back in order to avoid small roots and other plant reguse which is apt to be present at that depth and which might influence the accuracy of the tests. Surface samples should be taken with any convenient implement at a depth of from one to four inches. Several sub-soil samples should be taken in order to map out a long-time program of soil management. The samples may be taken at any season of the year and the tests run in the field or the samples may be brought into the office and all run at one time. The tests should not be run when the soil is wet. It should be allowed to dry out in the air but should not be dried with artificial heat. This may ruin the results of the tests. The large lumps of soil should be broken up but it is not necessary to grind the samples.

Most soils need a considerable quantity of phosphorus. In Illinois tests have shown that only 25 percent of the land has sufficient phosphorus for most efficient production. Generally speaking, the available phosphorus is more important than lime, but both should be taken into consideration for efficient management.

The nitrogen test may be conducted on the foliage or stem of any kind of plant. The potash test is valuable on monocotyledonous plants, such as corn, but is not as accurate as the other tests.

(The commercial names of these tests are purposely omitted in order to allow this report to be sent out under the franking privilege. Detailed information may be obtained from the speaker or from the canning crops specialists of the Extension Service, University of Maryland.

Discussion:

Very few Maryland growers use too much phosphorus. The greatest need of the soils in this section, however, is organic matter, and sweet clover is one of the best crops to supply this material. Phosphorus must be used to get a stand of sweet clover.

The tops, stems and roots of sweet clover decompose within different time limits, and the benefits from turning under a stand of this crop have a more lasting effect than a crop of red clover. A common practice in some sections is to plant sweet clover with peas, or the clover may be sowed after the peas are up. It is sometimes planted in corn at the last cultivation, but the experience of some growers in this section is that the clover heaves out of the ground during the winter. If crops other than hay or pasture are to follow sweet clover, it should be turned under before it becomes very large.

LUNCHEON

Greetings - R. A. Pearson, President, University of Maryland.

Response - Ralph O. Dulany, President, Tri-State Packers' Association.

Address - H. J. Patterson, Director and Dean, Maryland Experiment Station and College of Agriculture.

SOILS AND FERTILIZERS. (Cont.) Chairman, E. G. Cover, Easton, Maryland.

The Effect of Fertilizers on the Yield and Quality of Canning Crops

by

Dr. V. R. Boswell, U. S. Department of Agriculture

Although numerous experiments have been conducted in the fertilization of canning crops, the results obtained have been somewhat unsatisfactory because of the wide variation in soil and climatic conditions. There is a certain amount of agreement between the different experiments, however, and some general conclusions can be drawn for the different crops.

Publications from the various state experiment stations give the following recommendations for fertilizer analyses for tomatoes: New Jersey and Delaware, 4-8-10; Pennsylvania, 6-12-4 for the early crop and 4-16-4 for the late crop; Indiana, 2-12-4; Missouri, 2-12-2; and Arkansas and New York, 4-12-4.

The amount of fertilizer recommended per acre for tomatoes varies with the soil type and with the previous treatment. The average recommendation is about 800 pounds per acre. Applications run as high as 1200 pounds per acre with profitable results. Phosphorus promotes early growth and should be included in relatively high proportions in tomato fertilizers.

Comparatively little accurate experimental work has been conducted on sweet corn. The best results have been secured with manure and acid phosphate. Where no manure is available, however, an analysis of 3-8-4 or 4-8-4 is generally recommended. Best results have been secured with hill or row applications. Not more than 200 pounds per acre should be applied in the row and the rest broadcast.

Experiments conducted in Maryland show that fertilizers high in nitrogen have given best results with peas. Applications of 200 to 500 pounds of a 7-6-5 are recommended for the lighter soils of the Eastern Shore. In Western Maryland and on the heavier soils of the Eastern Shore, it is probably not necessary to use so much nitrogen. One-third of the nitrogen should be in the organic form, one-third should be nitrate of soda, and one-third should be sulfate of ammonia.

There is a close relationship between quality and yield of most crops. When yields are high the quality is likely to be correspondingly high. Recent experiments conducted at the Maryland Experiment Station by Mr. Matthews show that the profit per acre, yield in cases per ton, and the quality of the raw and canned product was considerably higher on high nutritional plots than on low nutritional plots. This justifies the Maryland slogan, "More Tomatoes from Fewer Acres".

The Drought Effects of 1930 and the Possibilities of Irrigation for Canning Crops

by

G. A. Mitchell, U. S. Department of Agriculture

The most important factor in considering irrigation for canning crops is that this is largely a new project and that relatively little specific information is available. Irrigation has developed steadily in southern New Jersey during the past twenty-five years on market garden crops, but the grower for the canning factory and the grower for the fresh market face vastly different conditions, the most outstanding of which are the kinds of crops grown and the prices received for these crops.

In the eastern states, lettuce, snap beans, bunch carrots, bunch beets, celery, early cabbage, spinach, eggplants and cucumbers are most widely grown on irrigated land and are probably the most profitable. Tomatoes for the fresh market have been sucessfully grown under irrigation in some of the eastern states, but it would seem a hazardous undertaking to install an irrigation system with the intention of making tomatoes prominent in the list of crops to be included for irrigation. No move has been made to irrigate lima beans for canning in sections where irrigation is well understood. The attitude of canners and farmers living in sections where irrigation is carried out for fresh market vegetables seems to be that few crops grown for canning would pay for irrigation.

It is the consensus of opinion that irrigation of beets for canning would be profitable. They should not be irrigated for some time before harvesting, however, in order to maintain the desirable color.

Snap beans, on an average, seem to be one of the canning crops that will pay under irrigation. The opinion of some practical growers, however, is that too frequent irrigation of canning beans makes them stringy when canned. An application of water once a week or every ten days does not seem to be harmful.

The cost of overhead spray irrigation systems in five- or ten-acre units, where pumping is from wells or streams adjacent to the land, varies from $250 to $375 per acre, and sometimes more. If the installation cost is $300 per acre, it means that the annual charge per acre for irrigation, including feul, labor, and depreciation, is $36, omitting interest on the investment. If the increased value of the crops sold is $50 per acre, the difference of $14, or 4.67 percent, will be the amount of interest earned on the investment. If the increase in net returns is $100 per acre, the interest will amount to $64 or 21 percent on the investment.

Many of the expenses attached to overhead irrigation are a yearly charge on the crop and it is necessary to make an average yearly profit of fifty dollars an acre in order to make the installation a reasonably profitable venture.

Surface irrigation, which usually costs less per acre, is another method of supplying water to crops. This consists in delivering the water over the surface of the ground by such methods as running it down the furrows or by spreading it broadcast over the tract to be irrigated. The furrow method is used for the irrigation of cultivated row crops and orchards. Either open ditches or pipe lines may be used to deliver the water to convenient points for distribution into the furrows. Where the soil is so sandy or porous that a great deal of seepage would occur in the ditch, or where the topography between the source of water and the field to be irrigated is too irregular to construct a ditch at reasonable cost, it is advisable to use a pipe line to distribute the water.

For surface irrigation, the land must have a reasonable, uniform slope away from the source of water.

The quantity of water needed for surface irrigation is from 50,000 to 100,000 gallons per acre for each irrigation. A sandy soil requires approximately twice as much water as a heavy soil.

The frequency of irrigations depends on many factors. The number of days which may be allowed to pass between irrigations during the hot summer, in case plentiful rains do not occur, should not be over ten. For some crops and under some conditions it should be less.

The supply of water should be adequate and should be conveniently located to the area to be irrigated. Water for irrigation should be free from everything that will injure plants or people and should not cantain sand or other material that will cause undue wear in the pump.

Surface installations with low pumping lifts and open ditch distributing systems should not cost, installed, more than $25 to $30 per acre, in 20 acre units, if the source of water is conveniently located. The cost increases as the lift and the distance to the source of water increases. It may be as high as $175 to $200 per acre, with a 30 to 60 foot lift.

Revolving, single-nozzle irrigation outfits have been used successfully on limited areas. These nozzles operate through a radius of about 120 feet.

SOIL MANAGEMENT. Chairman, S. H. Shriver, Westminster, Maryland.

Proper Soil Management for Largest Yields and Maintenance of Fertility of Canning Crops Soils

by

J. E. Metzger, University of Maryland

There are so many angles to the problem of soil management that it is impossible to treat them all in a short time. Some of them, however, are so important that they could not be omitted. Among these are crop rotations and soil types, cultural methods, and fertilizer treatments and practices.

Crop Rotations:

On new land or in special crop production, there is always a tendency to either grow a crop continously or to use as short a rotation as possible. The rotations in the general farming sections of Maryland are very well balanced. Where sweet corn, tomatoes, snap beans and lima beans are grown in the Piedmont section and on the heavier soils of the Eastern Shore, they have in most cases replaced some of the corn acreage and have not materially disturbed the crop rotations.

It is on the land, usually owned by the canning company, where as large a part as possible is planted to canning crops that a suitable and workable rotation is a real and vital problem. In general, not more than one-half of the area should be planted to cultivated crops. This is for reasons pretaining to the maintenance of organic matter, the difficulties that may be experienced with plant diseases and insect pests, and the need for protection to the soil itself during the winter months. The lighter or more sandy the soil, the greater will be the need for exercising care in arranging the rotation. Rotations are desirable and necessary not only for these reasons but also because the fertility requirements of crops are variable. It is possible to work out a single rotation for a farm in which all of the canning crops are included, but it is much more practical to have several rotations even on the same farm. Several examples of these rotations are shown on the following page.

There is more merit to the use of separate rotations for the chief canning crops than might be suspected from first thought. The idea has the special merits of adapting the rotation not only to the soil types but also the very desirable quality of using judiciously the kind of fertilizer analysis needed.

Fertilizers for Maintenance:

In making a fertilizer recommendation one should alwaysbe specific as to the conditions involved. Consideration should be given as to whether the application is a part of a long-time program of soil improvement or maintenance or whether it is an attempt to produce a single profitable crop in that given year. Every farm is a separate problem unless the crop and fertility situation has been known for a period of years.

A number of suggested rotations are given below, with the fertilizers that one might be justified in using for each:

Four-Year Rotations

	Heavy Soils	Light Soils
Rotation A		
1. Sugar corn (rye or rye and vetch)	200 lbs., 2-12-4	300 lbs., 3-12-4
2. Peas or snap beans (alfalfa and clover or sweet clover)	300 lbs., 5-8-5	400 lbs., 5-8-5
3. Tomatoes	500 lbs., 4-8-7	600 lbs., 4-8-7
4. Wheat (sweet clover)	200 lbs., 2-12-4	200 lbs., 2-12-4
Rotation B		
1. Sugar corn	300 lbs., 2-12-4	400 lbs., 3-12-4
2. Peas or snap beans	300 lbs., 5-8-5	400 lbs., 5-8-5
3. Winter barley or wheat	200 lbs., 2-12-4	200 lbs., 2-12-4
4. Alfalfa and clover	Manure	Manure
Rotation C		
1. Tomatoes	600 lbs., 4-8-7	800 lbs., 4-8-7
2. Wheat (sweet clover)	200 lbs., 2-12-4	200 lbs., 2-12-4
Rotation D		
1. Sugar corn (rye)	300 lbs., 3-12-4	400 lbs., 3-12-4
2. Peas or snap beans (sweet clover)	300 lbs., 5-8-5	400 lbs., 5-8-5
Rotation E		
1. Sugar corn (rye)	300 lbs., 2-12-4	400 lbs., 3-12-4
2. (a) Peas	300 lbs., 5-8-5	400 lbs., 5-8-5
(b) Lima beans	200 lbs., 5-8-5	200 lbs., 5-8-5
3. Wheat (sweet clover)	200 lbs., 2-12-4	200 lbs., 2-12-4

All of the suggested fertilizer recommendations are on a rotation basis rather than on a crop basis and the assumption is made that the land is in a good state of fertility. Under these conditions they should be sufficient to maintain the soil fertility at the desired level and thus produce the maximum yields for the season in question

Cultural Methods:

The cost of land preparation and crop cultivation runs somewhere between 20 and 30 percent of the total cost of production for most corps. For corn, including all items except the harvesting, it is about 35 percent. If saving can be affected anywhere it can probably best be done on these items.

Corn is the only one of our canning crops that permits the use of a type of machinery which not only greatly reduces the cost but also does effective work. The smoothing harrow and rotary hoe are the best implements for this purpose. Cultivation with these implements may begin before the plants emerge and continue until they are five or more inches high. In the latter stages the work must be done during the mid-day hours, from about 10 a. m. to 4 p. m., and on relatively clear days to avoid injury to the plants.

With cultivated crops like tomatoes and beans, early plowing and partial preparation of the land will induce most of the weed seed to germinate and subsequent seed bed preparation will kill these, which materially reduces the cost of later cultivation. In addition, early plowing insures the proper contact between the furrow slice and the bottom of the furrow which in turn establishes the desired and necessary flow of capillary water.

The type of implement as well as its mechanical condition is a cost factor. In general, the heavier and larger unit sizes do the best work at the lowest cost.

The Importance of Organic Matter in Canning Crops Production

by

T. C. Johnson, Director, Virginia Truck Experiment Station

Extensive experiments conducted at the Virginia Truck Experiment Station at Norfolk show that organic matter is necessary to maintain fertility of the soil. In a rotation of kale, cabbage, potatoes and sweet potatoes, the application of organic matter, either in the form of manure or of a green manuring crop, on soil low in fertility increased yields of all crops except sweet potatoes. Even in this case the vines made abundant vegetative growth.

During the first six years of the experiment the manure treatment produced greater yields than the green manuring treatment. During the latter six years, however, the yields secured from the green manuring treatment were equal to and in some cases greater than those from the manure treatments.

Many potato growers have adopted the practice of growing potatoes and sorghum or corn in alternate rows. This practice has resulted in increased yields. Many canners in Virginia have also adopted the program of growing green manure crops in the rotation. The canning crop is usually followed by sorghum or corn.

Corn and sorghum is turned under when four to five feet high, and soybeans when two to three feet high. Rye has been found to be effective in maintaining soil fertility. It is generally planted immediately after the canning crop is harvested.

Regulating the Acidity of Canning Crops Soils

by

H. H. Zimmerly, Virginia Truck Experiment Station

Lime Requirement of Individual Crops:

Different plants have a different lime requirement because they vary in their tolerance of acid soil conditions. Tomato seedlings grown in an acid soil exhibit symptoms of phosphorus starvation. The growth is slow and a red pigment develops in the leaves. This condition can be remedied by applying lime or large quantities of acid phosphate to the soil. Apparently phosphorus in

strongly acid soils is rendered unavailable to plants, and it is recommended that lime or both lime and acid phosphate be applied to increase the available phosphorus in the seed bed when the reaction is pH 4.5 or lower.

Beets, especially in the seedling stage, are sensitive to acid soil conditions, showing wilting, blackening of the roots, and even death in extreme cases. Growth is best on neutral (pH 7.0) or slightly acid (pH 6.5) soils. Carrots are slightly more tolerant than beets, growing best within a pH range of 5.8 to 6.5. For this crop, it is suggested that the soil acidity be reduced below the criticial point, which seems to lie between a pH of 5.5 to 5.8. Lima beans, snap beans and peas are moderately tolerant of acid soil conditions, developing best at pH reactions of 5.4, 5.6 and 6.1, respectively.

Determining the Lime Requirement of the Soil:

In general, two methods for determining the lime requirement of the soil are available. Colorimetric determinations, one of which has been described in this session, are useful but are not as desirable as electrometric determinations. For the latter, an outfit is available, costing about $70 complete, which is simplified in operation, making it available to county agents and growers. The degree of acidity of the soil is given by this outfit in terms of pH, from which the lime requirement of the soil is determined in consideration of the crop to be grown and the type of soil. A strongly acid, fine sandy loam soil with a pH reaction of below 5.0 would require about 2,500 to 3,000 pounds of finely ground limestone to reduce the acidity to around pH 6.5, the reaction favorable for the growth of beets and carrots. If the soil is of the coarse, sandy type, only three-fourths as much lime is required. If the soil is heavier, from one and one-quarter to one and a half times as much lime might be required.

Correcting Soil Acidity:

Lime may be used in several forms for correcting soil acidity. The choice should be based on the cost per unit of neutralizing power, or, in other words, per unit of calcium. Finely ground materials are desirable in order to secure quick action. The natural fineness of hydrated lime and its relatively high calcium content makes it desirable. Burned lime (stone lime) has a higher calcium content but is disagreeable to handle and if used in large quantities may react unfavorably with the organic matter in the soil. From the reports issued by the New Jersey and Rhode Island Experiment Stations there are no objections to the use of calcium-magnesium (dolomitic) limes.

Lime should be applied to the field after plowing and worked into the upper two or three inches of soil by disking. If the soil is very acid and sensitive crops are to be grown this should precede planting by at least a month.

GENERAL SESSION. Chairman, A. D. Radebaugh, American Can Company

The Seed Bean Situation
by
Dr. W. J. Zaumeyer, U. S. Department of Agriculture

A survey was made during July, August and September of 1930, covering examinations of bean fields in Colorado, Utah, Wyoming, Montana, Idaho and California to determine the relative prevalence of diseases in the different sections. The observations made include not only the snap or garden bean varieties, but also field and lima beans as well. The report is based on obser-

vations made in a total of 312 fields of garden and field beans and 52 of lima beans.

The following summary reports the disease situation which existed:

The bacterial blights were not found in California, a trace in five fields in Idaho, sparingly in Utah, Colorado and Wyoming, and slightly more abundantly in Montana.

Anthracnose was not observed in any of the commercial acreages in the States visited. A trace was noted in trial plots at Greely, Colorado, where eastern-grown seed infected with the disease was planted.

Mosaic was again widespread as in 1929. It was very prevalent in southern Idaho, slightly less in Colorado and Utah, and still less in Montana, Wyoming and California.

Curly top of beans was widespread and destructive in certain sections of southern Idaho. The amount of the disease could be correlated with the dispersal of the beet leafhopper. In all of the other states it was of no consequence.

The root rots were found in small amounts in all of the states surveyed but were causing little damage.

Powdery mildew was seen only in California where it caused little damage. In one case it caused a premature maturation of the plants.

Rust was found in Colorado and southern California but was of minor importance. In Colorado a trace of infection was observed after August 15 but no damage resulted.

Nematode injury was observed in Los Angeles County, California, causing a decided reduction in stand in a number of plantings.

From the standpoint of Maryland conditions, anthracnose is the most important seed-borne disease. Bacterial blight is present in most fields and causes considerable damage but is not so serious as in many other states. Mosaic occurs in many fields but causes very little reduction in yields. The root rots result in considerable loss, but these are caused by soil organisms.

Canning Crops in New York State

by

Dr. F. W. Geise, American Can Company

(Remarks not for publication at this time)

Review of Insects Affecting Canning Crops

by

P. D. Sanders, University of Maryland

Very accurate records show that during the past twenty-five years insects have destroyed an average of ten percent of all crops, and more often this damage to truck crops and fruits averages twenty percent. In most cases this damage can be largely eliminated at a very low cost by the adoption of approved insect control practices. Growers of canning crops have made great strides in insect control during the past few years as a result of the Mexican bean beetle invasion, but much more remains to be accomplished.

In line with the efforts of the canning industry in 1931 to lower the cost of producing high quality raw materials, every grower of canning crops is urged to take advantage of the vast amount of available information on insect control and to reduce crop losses and the poor quality due to insect depredations.

Every tomato plant bed in 1931 should be sprayed with Bordeaux mixture and arsenate of lead or dusted with 20-20-60 copper-arsenate-lime dust. Tomato plants should not be set in sod land unless special efforts are made to control cutworms with poison bran mash.

Bean growers should keep a lookout for the black bean aphis which often appears and causes losses in certain localities of the State. It may be controlled by spraying with nicotine sulfate, 1 pint to 100 gallons of water, or by dusting with a two percent nicotine dust.

Perhaps the two most outstanding insect developments on canning crops last year were the scarcity of the Mexican bean beetle and the great increase in abundance and destructiveness of the corn earworm on corn, tomatoes and beans.

Corn Earworm:

The corn earworm does some damage every year in Maryland to corn, beans and tomatoes alike, but this damage is so common and widespread that growers have become accustomed to it and regard it as a normal loss. It is only in years like 1930, when a tremendous outbreak occurred, that the importance of this insect is observed. The corn earworm passes the winter as a pupa in the soil at a depth of from 2 to 9 inches, emerging early the following summer as a moth ready to lay from 500 to 5000 eggs, which hatch in a few days into worms. Normally about three generations or broods occur annually in Maryland. The greatest damage comes in late summer and early fall when the worm population has had sufficient time in which to build up.

Control:

1. Land where injured crops were grown last fall should be plowed to destroy overwintering worms before they emerge in 1931.

2. If the worms begin to appear on beans, spray with barium fluosilicate, 1 pound to 50 gallons of water. If they appear on tomatoes, spray with Bordeaux mixture, 4-5-50, plus 1½ pounds of arsenate of lead.

Mexican Bean Beetle:

The scarcity of the Mexican bean beetle in 1930 was due largely to the high temperature which practically wiped out all stages of the first brood. No great damage is expected on early or mid-season beans in 1931, except possibly in lower Somerset, Worcester, Cecil, Garrett and part of Allegany counties, where a considerable number of beetles went into hibernation last fall.

Control:

A summary of a field experiment in 1930 on the Beltsville Experimental Farm of the University of Maryland, containing 45 plots, showed that magnesium arsenate, 1 pound to 50 gallons of water, gave the best control of the insect. Barium fluosilicate used at the same rate gave good control and is advised as an arsenical substitute when it is necessary to spray after the pods have formed.

Both 15-15-70 and 20-20-60 copper-arsenate-lime dusts gave good control of the beetle and did not injure the foliage, even when applied while the plants were wet.

Review of Diseases Affecting Canning Crops

by

H. A. Hunter, University of Maryland

Most of the diseases of canning crops were less severe under the drought conditions of 1930 than in a normal year. This was particularly true of the leaf-spot diseases, such as Septoria and early blight of tomatoes. Some diseases were of outstanding importance, however, and these deserve particular mention.

Blossom-end rot of tomatoes caused an exceptionally high loss in most sections of the State. This trouble is caused by a variation in the water supply of the plant and is usually of considerable importance in a dry year. The Marglobe variety was not as seriously affected as most of the other canning varieties used in this section. The depth of cultivation during the latter part of the season had a significant bearing on the amount of the disease, also. Deep cultivation injured the root systems of the plants, decreasing their water-taking ability, and causing an increase in the amount of the rot.

Collar rot is another disease of tomatoes which caused quite a bit of trouble in some sections. The organism is the same as that which causes early blight of tomatoes and potatoes. The disease attacks the stems near the soil line, usually before they are pulled from the plant bed. The canker caused by the disease weakens the stems so that the plants may fall over. The severity of the disease this year can probably be attributed to heavy dews and high winds just before the plants were pulled from the beds and to the fact that many plants were held in the beds longer than they should have been, in an effort to catch a good setting season. Such conditions as the above cannot be anticipated or remedied. However, it is a good plan for all growers to obtain treated seed, or to treat their own seed with mercuric chloride, and to change the location of their plant bed each year.

Root rots of snap and lima beans caused a greater percentage loss this year than normally. These diseases are present each year in most fields and cause considerable loss, but under the drought conditions of the past year the interference with the root system was felt more than in an average year. The diseases are usually worse where beans are grown successively on the same land for two or more years. Inasmuch as rotation should be practiced for the control of other diseases, also, it seems highly desirable that beans be grown on the same land only once in four or five years.

Anthracnose of snap beans is a disease which is ordinarily considered of very little importance in a dry year. However, the disease caused heavy losses in some sections of the State last year when proper precautions were not taken for its control. It is a well-known fact that seed produced in the semi-arid sections of the West have very little, if any, infection with the anthracnose organism. Seed produced in the more humid portions of the eastern United States is apt to carry heavy infection. Considering the potential losses which may be caused by the disease in a favorable season, it seems that all canners and growers should protect themselves by securing seed from the West. Tests have been conducted in Maryland for the past three years which indicate that the organism may live over winter in the soil for at least two years. This means that beans planted back on the same land which has produced a diseased crop

within the two-year period may become infected with the disease. The tests are being continued to try to determine the length of time that the organism may live over in the absence of beans. Until other information is obtained, it would seem advisable to practice at least a four-year rotation with other crops.

If it were possible to predict weather conditions far in advance, it might be possible to modify disease control measures. Inasmuch as this is impossible, the normal recommendations should be carried out for the coming year. The following recommendations are given as generally applicable under Maryland conditions:

Snap Beans

1. Rotate the land for four or more years
2. Use western-grown seed
3. Avoid spreading diseases in the field when vines are wet with dew or rain

Lima Beans

1. Rotate land for several years with crops other than legumes
2. If diseases become sufficiently serious, dust or spray with copper fungicide, in connection with beetle control

Peas

1. Rotate land for at least four years with crops other than vetch or alfalfa
2. Plant on well-drained land

Sweet Corn

1. Treat early-planted seed with organic mercury dust

Tomatoes

1. Fall plow tomato land where possible
2. Use wilt-resistant varieties on infested soil
3. Use new location for plant bed
4. Treat seed with mercuric chloride, copper sulphate, or organic mercury dust
5. Spray plants in bed with Bordeaux mixture or dust with copper-lime dust
6. Give covered beds sufficient ventilation
7. Cultivate shallow in latter part of season

U. S. Grades for Canning Crops

by

F. M. Shook, Tri-State Packers' Association

With the passage of the Mapes Bill, practically no market exists for substandard tomatoes. The canner must make every effort to hold his product up to a standard or better. The use of stock bought on a graded basis increases the working efficiency of the cannery help and promotes the possibility of securing a high grade pack. It is perhaps the most practical way to secure high quality in manufactured tomatoes.

Buying on the graded basis, as successfully practiced in Indiana, New Jersey, and other states seems to be the most logical and fairest method of purchasing tomatoes. It places emphasis on quality rather than quantity, in both the raw and manufactured product. It enables the grower of good tomatoes to get a better price for his crop. It enables the canner to pack not only a higher quality product but also a higher proportion of it. It enables the grower to spend more time and money on the production of high quality tomatoes and serves as an incentive to pick and deliver only red ripe, sound fruit, because a premium sufficiently large to pay for the extra cost is given for number 1 tomatoes.

The tomato grading work was started in Indiana in 1927 in an experimental way. It was found from this work that the canning crop tomatoes were running about 30 percent number 1's, 50 percent number 2's, and 19 percent culls. In 1928 ten canning companies bought on the graded basis, and in 1929 seventeen companies used the system. About forty companies used the grades in 1930. In 1929 the average grades at all the factories ran 51 percent number 1's, 45.81 percent number 2's, and 3.19 percent culls. The growers received $13.76 per ton as against a flat rate price of about $13. A full ton of usable tomatoes cost the canners $14.18 as compared to $16.05 on the flat rate basis, where the culls ran 19 percent.

VEGETABLE GROWERS NEWS LETTER
Issued by
The Maryland Vegetable Growers' Association
W. R. Ballard, Secretary-Treasurer.

Vol. VIII. No.4. College Park, Md. April, 1931.

Cooperative Sales Agency

The Federal Farm Board following out its plan to stimulate the cooperative movement is actively engaged in perfecting plans for establishing a cooperative sales agency to merchandise miscellaneous fruits and vegetables. The organization committee met recently in Washington and agreed on the type of organization to be set up. A subcommittee will develop the details of the plan which will be submitted to the cooperatives for final approval.

Cooperatives in twenty-one states participating in three sectional conferences leading up to the selection of the organization committee.

Crop Estimates

The Division of Crop and Livestock Estimates reports that intentions to plant indicate 5% increase in acreage of canteloupes in the intermediate group of states which includes Maryland. The Farm Board is warning against overproduction of potatoes as reports indicate for the country as a whole, a proposed increase in acreage of late potatoes amounting to about 10%. Indications are that the acreage of snap beans for canning will be cut about 20% for this year. The intended acreage of sweet corn for manufacture will be apparently 2.4% less than the harvested acreage of 1930 and nearly 11% below the planted acreage of last year.

The acreage of tomatoes intended to be planted in the intermediate group of states appears to be 4% greater than the 1930 acreage and 17% greater than the average acreage for the previous five years, 1925 to 1929.

Certified Seed Potatoes

The demand for certified seed potato stock has been quite brisk this spring and the Maryland supply is now practically exhausted.

The following new regulation in regard to certification of medium late potatoes in Maryland has been made by the Maryland Seed Certification Board.

Experiments with medium late potatoes in Pennsylvania have shown that the yield is reduced when seed is grown in warm climates more than one year. Since it is the policy of the Maryland Seed Certification Board to certify only high yielding disease free seed, fields of Rural Russet, Smooth Rural, Green

Mountain, Gold Coin, and other medium late varieties grown at an elevation below 2,000 feet in Maryland will not be eligible for certification unless they are grown from certified seed produced in parts of Maryland above 2,000 feet elevation or in Michigan, New York, or other northern states acceptable to the Seed Certification Board. Certified seed tags from the packages containing the seed to be planted will be acceptable as evidence that the fields have been grown from such seeds.

This regulation does not apply to early varieties such as Cobbler, nor to very late varieties such as Jersey Redskin and McCormick.

The Home Vegetable Garden.

As an aid to farmers in the drouth stricken areas emphasis is being given to the value of the home garden in supplying the family with food. This calls for a relatively small outlay of cash. In extreme cases the Red Cross is furnishing free seeds to families unable to purchase them.

The tendency of late years toward mass production of vegetables will probably prevent a very great swing back to complete home garden except as an emergency measure. With some of the vegetables it is cheaper to buy than to raise in the small garden. On the farm, however, the staple vegetables should be produced. They should be planted in long rows and far enough apart so that most of the work can be done with horse tools.

VEGETABLE GROWERS' NEWS LETTER
Issued by
The Maryland Vegetable Growers' Association
W. R. Ballard, Secretary-Treasurer.

Vol. VIII. No.5. College Park, Maryland. May, 1931.

Progress With Resistant Peas.

J. C. Walker, of the Wisconsin Experiment Station has just reported in Research Bulletin 107 the results of tests made with 243 samples of Alaska peas. Strains were found ranging from 100% susceptibility to Fusarium wilt to 100% resistance. These tests were conducted on fields known to be thoroughly infested with the wilt.

A resistant strain selected out by Prof. C. E. Temple, of the University of Maryland and now being grown for seed, was found to be highly resistant and in addition was quite uniform in character.

These tests indicate great promise in the future elimination of this disease as a commercial hazard. It must be remembered, however, that resistance to this disease does not imply resistance to any other pests.

Identifying Mushrooms.

Mushrooms are often collected in the fields and marketed. It is not often that one hears of poisoning resulting from mistaken identity of edible sorts, but the danger is so prevalent that some precautions should be taken to avoid tragedies.

Circular No. 143, Some Common Mushrooms and How to Know Them, has just been issued by the U. S. D. A. The author, Vera K. Charles, discusses a number of the common mushrooms and other fungi and provides convenient, safe, and practical means for their determination. No one should experiment with the eating of unfamiliar kinds of fungi until he is absolutely certain that they are edible species. Many of the prevailing notions regarding tests are erroneous, and it is better to be safe than sorry.

The common or cultivated mushroom, Agaricus capestris is widespread, occurring abundantly in pastures, grassy places, golf courses and richly manured ground. The only danger in collecting is in mistaking an Amanita for an Agaricus. In the button stage it is very difficult to distinguish between poisonous and edible species.

This circular may be secured by sending 20 cents to the Superintendent of Documents, Washington, D. C.

Grading Standards.

Growers producing for the wholesale markets should be interested in a copy of "Recommended Standards" issued by the Maryland State Department of Markets, College Park, Maryland. Shipping-point inspection of fruits and vegetables has been in successful operation for some months. This service is optional, but

is available to any financially interested party upon application. The certificates issued are Federal-State certificates, acceptable as prima facie evidence in all United States Courts.

The Chain Store Changes Conditions.

Market gardeners have been much perturbed of late because of the glutting of the local markets by produce trucked in from distant points. In this dilemma a few growers are making contacts with chain store buyers and contracting in advance to grow a certain acreage of specified crops to be delivered entirely to the buyer. These growers seem well satisfied with this arrangement.

The future may see an enlargement of this scheme. In many cases it will be necessary for several growers to combine in order to secure the required acreage.

The other alternative is producing vegetables of extra quality for a special trade. There will always be independent stores to cater to this fancy trade, and this will offer the skillful grower an outlet for the products of his skill.

Production of Certified Seed Potatoes.

The U. S. Bureau of Agricultural Economics reports that in 1930 approximately 6,283,924 bushels of certified seed potatoes were produced. This production was distributed mainly among 22 states. The more important producing states are listed below in the order of quantity produced.

	Bushels		Bushels
Maine	2,709,808	Vermont	103,350
New York	602,561	Washington	85,085
Minnesota	548,291	Oregon	80,150
Nebraska	481,800	Montana	69.962
North Dakota	372,000	Colorado	51,945
Wyoming	299,780	New Jersey	49,666
Wisconsin	261,391	Pennsylvania	46,016
Michigan	212,125	New Hampshire	36,064
Idaho	188,882	South Dakota	27,790

While Maryland comes in with only 16,813 bushels, due to dry weather, in 1929, this figure ran up to 40,488 bushels.

Green Mountain, Irish Cobbler, Triumph, and Rurals are the leaders. Other varieties assume considerable importance in certain sections.

The Rainfall.

Records at the College Park Weather Bureau show that up to the middle of May the rainfall this year is slightly higher than for the same period last year, but is still about 3.5 inches below normal. With the depleted resources in lower strata a good deal will hinge upon getting rains properly distributed through the growing season.

The records are as follows:

	Normal	1930	1931
January	3.26	3.24	1.49
February	3.17	1.80	1.82
March	3.63	2.30	3.92
April	3.47	3.33	2.55
May (1st - 15th)	1.94	.975	2.16

Temperature conditions in May so far have been much more favorable this year than last, the average last year running nearly 20° higher.

VEGETABLE GROWERS' NEWS LETTER

Issued by
The Maryland Vegetable Growers Association
W. R. Ballard, secretary-Treasurer.

Vol. VIII. No.6. College Park, Maryland. June, 1931.

The Annual Potato Tours

Growers, investigators and others interested in the potato industry gathered on Thursday, June 18th, to inspect the progress of experiments and demonstrations in the Virginia Counties of Northampton and Accomac. On the following day the group moved over into Maryland where R. T. Grant, County Agent of Worcester County explained the nature of the seed source tests. Dr. R. A. Jehle, Plant Pathologist for the Extension Service explained the results of the seed source tests. The group was also addressed by Dr. E. L. Nixon, Professor of Plant Pathology of Pennsylvania State College and Dr. Tucker, of the Dominion of Canada Department of Agriculture. The following points were brought out by the tests and demonstrations during the tour;

1. The value of using the best certified seed obtainable for planting both the commercial crop and that grown for seed.

2. The value of liming extremely acid soils and the danger of applying too much lime on account of the development of potato scab.

3. The value of spraying the fields with bordeaux mixture.

4. The value of using fertilizers adapted to local needs.

One of the interesting features of the tour was a "Disease Detection Contest." Contestants inspected ten rows of potatoes approximately 100 feet long indicating the number of plants infected with the mosaic disease and with leaf roll. The object of the contest was to assist potato growers to recognize these diseases. Mosaic and leaf roll are the two most destructive seed borne diseases and all plants infected with these diseases in seed potato fields should be pulled up and destroyed as soon as they can be recognized. The three contestants making the highest scores were each presented with a barrel of certified seed potatoes. The winners in this contest were Chester D. Holland, L. L. Colona and W. T. Bunting, all Worcester County potato growers.

Dinner was served by 4-H Club members at the farm of F. J. Dukes & Bro. Girdletree. After dinner, Dr. H. J. Patterson, Director of the Maryland Experiment Station discussed "Potato Experiments of Value to Eastern Shore Growers," while Dr. J. E. Metzger discussed "Lime and Legumes in a Potato Rotation." Dr. F. B. Bomberger of the Federal Farm Board and others made brief talks.

Fertilizer demonstrations showing results from the use of ammonia from various sources were observed at the farm of Henry Cherrix, Scarboro, while at the farm of Jerome Johnson, north of Snow Hill, experimental plots were inspected. These plots showed the effects of green manures; of various forms or nitrogen, potash and phosphoric acid; the application of varying amounts of fertilizers and the effects of using fertilizers of different analyses and

the effect of using concentrated fertilizers on both white and sweet potatoes.

New Horticultural Building

Good progress is being made on the new Horticultural Building now being erected on the University Campus. The site selected is directly north of the Agricultural Building across the county road. This is just south of the present egg laying contest conducted by the Poultry Department.

The main section of the building will be three stories high with two wings two stories each and a one-story packing section in the rear. This, with the recently acquired horticultural farm near Branchville will give the Horticultural Department important and much needed facilities.

Available Phosphoric Acid

Phosphoric acid seems to have a good deal to do with the growth of plants. There has recently been devised an apparatus for testing the availability of this essential plant food which is destined to play an important role in the future of agriculture. The test itself is not difficult to make. A few days ago Mr. Thos. H. White of the Experiment Station found, in checking the availability of the phosphoric acid in potato plots, that the growth of the plants corresponded closely with the availability of the phosphoric acid as shown by the test.

Carbon dioxide given off by the decay of organic matter in the soil seems to be concerned with the unlocking of the phosphoric acid, thus making it available for the use of plants. Fortunately phosphate does not leach out of the soil readily.

Krant Supply in Sight

Reports from the Bureau of Crop and Live-Stock Estimates indicate that there will be plenty of late cabbage this fall. The total intended acreage grown for market is 60,670 acres, or eight per cent more than a year ago. The bulk of the crop is grown in New York and Wisconsin.

The Five-Year Program

Extension Circular 86 entitled "Agricultural and Rural Home Program for Maryland" has just been distributed. Under the heading of Market Gardon or Truck Crops are listed the following objectives:

(a) Maintain the acreage of truck crops at approximately the present level and reduce production costs 2% each year.

(b) Increase the annual production of certified white potato seed from 25,000 bushels to 60,000 bushels and certified sweet potato seed from 2,500 bushels to 15,000 bushels.

(c) Increase acreage of asparagus 10%.

(d) Reduce losses from seed-borne diseases in beans to one percent.

(e) Increase consumption of Maryland grown cantaloupes 10% by improvement in quality of product placed on the market.

VEGETABLE GROWERS' NEWS LETTER

Issued by
The Maryland Vegetable Growers Association
W. R. Ballard, Sedretary-Treasurer

Vol. VIII. No. 7. College Park, Maryland July, 1931.

"The Effect of Various Containers on the Growth of Vegetable Plants."

Under the above title, E. S. Haber of the Iowa Agricultural Experiment Station, reports on the results secured by growing plants in various types of containers. Paper pots, paper bands and similar types of containers generally gave poorer results than earthen pots. This lack of growth appears to be due to "nitrogen starvation." The organisms causing decay of the pot uses up the nitrogen of the soil which would naturally go to support the plant.

The "Summary and Conclusions" here quoted in full gives a good idea of the experiments and the results secured.

"The experiments indicate that clay pots are superior, as a general rule, to composition pots, paper bands or flats as a growing medium for vegetable plants. If the plants in these substitute containers, however, are watered, about every week or 10 days with a solution of nitrate of soda, sulfate of ammonia or any other nitrogenous fertilizer at the rate of 1 ounce to 1 gallon of water, plants equal to those produced in clay pots are possible. A few species may do as well without nitrates; cabbage plants grown in peat pots were slightly better than those in clay pots even without nitrates. Wood veneer bands were superior to paper bands except where sodium nitrate solution was applied to the plants in the paper bands. Nitrate applications given too freely and too often may result in producing plants with soft, succulent growth.

If plants are sensitive to acid soils, it is well to neutralize the acidity of the peat pots by soaking in lime water for at least 24 hours. Liming is not so essential where nitrates are used. The pulp pots and pulp planting pots are nearly neutral in reaction and do not require liming.

Plunged composition pots give better results than when the pots are not plunged in the soil in the benches. The pots, however, are harder to handle because they become soft. Since the roots grow thru the walls of some of these containers if allowed to remain plunged in the bench too long, many feeding roots are lost on removal to the field and the plants are checked in growth. Cost of composition pots may prevent their substitution for flat-grown plants, unless returns secured in the field make up for this increased sost in production of plants.

Plants grown in peat pots, pulp pots and pulp planting pots did not, as a rule, produce greater yields in the field than plants grown in clay pots. Generally, the yields from these pots were superior to flat-grown plants. Then in the last analysis the value of the crop or selling price of the plants, as well as the cost of the container, must govern the grower's choice in selecting a container for vegetable plant production."

Technical Bulletin No. 176 from the New York State Experiment Station rounds up the information regarding "Factors Affecting the Quality of Commercial

Canning Peas". The authors conclude that "In the experiments described in this bulletin one attempt has been made to affect the quality of canning peas thru the nutrients supplied to the plant. The work covers two seasons, two different soil types, and water culture. In the latter, far greater extremes in the mineral nutrition and in the mineral composition of the peas were secured than would ever be in the case of field culture. In spite of this wide variety of conditions, only minor differences in quality of peas of the same stage of growth have been obtained. Some treatments caused the peas to be higher in calcium, and these were measurably tougher than the others. Nevertheless, due to timely harvest, all samples were still classed as "fancy" when canned. We therefore feel safe in generalizing as follows;

With a soil and climate generally suited to peas, the grower can fertilize for quantity, and the quality will take care of itself. However, from the standpoint of quality, it would be a safe precaution to have abundant available potassium present, as this would tend to lessen the absorption of calcium. No difference could be detected between the chloride and the sulfate in potassium fertilizers in their effect on quality of peas, but the chloride form of calcium distinctly made harder peas.

These conclusions are based on the assumption that the peas are harvested at the proper stage, since peas under any condition of growth will become tough if their field life is unduly prolonged. In this connection, it is important that some way be devised of judging the time for harvesting which will be more accurate than mere inspection. In some fields the peas can be allowed to grow larger than in others without sacrificing quality. This would be advantageous to both grower and canner. It is believed that the "quality index" described in this bulletin has possibilities, and should be tried on a larger scale.

"Further evidence has been obtained in support of the canners' convictions that peas deteriorate rather rapidly after shelling. The changes are much more rapid in machine-shelled than in hand-shelled peas, because the bruising of the peas in the viner causes more rapid enzymatic action, also, calcium migrates to the skins and makes them tougher. If a less damaging way of shelling peas could be found, it would probably help in keeping more peas in the "fancy" grade."

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VEGETABLE GROWERS' NEWS LETTER

Issued by
The Maryland Vegetable Growers' Association
W. R. Ballard, Secretary-Treasurer

Vol. VIII. No. 8. College Park, Maryland September August, 1931.

"Fertilizing Vegetable Crops".

Under the above title Jesse M. Huffington of the Extension Service, State College, Pennsylvania, contributes a discussion of this important subject in circular 138. Some of the topics treated are: the value of manure, artificial or synthetic manure, selecting the best fertilizer ingredients, applying fertilizer, and fertilizer practices applied to individual vegetable crops. Growers can undoubtedly profit from reading this publication.

Potato Inspection Progresses.

In Garrett and Allegany counties 73 growers had potatoes inspected for certification this year with a total of 134 3/4 acres inspected. Of this total 67.75 acres were eligible for certification, the remaining 67 acres being disqualified on account of the presence of diseases, mixtures and other conditions. Last year 74 growers had potatoes inspected in these same counties with a total of 95.5 acres inspected and 48.25 acres eligible for certification.

Prices Fluctuate.

Yields of many of the vegetables in Maryland have been fairly good but the markets have been glutted so that prices in many cases have been unsatisfactory. Prices at times have been too low to warrant picking.

In this connection the July report of J. P. Brown, county agent of Wicomico county may be interesting reading.

"Cucumbers were selling for about $1.30 per bushel hamper during the first of the month. About July 7th prices had dropped to 70 cents per bushel, on the ninth to 60 cents and during the first part of the week of July 13th the low price of 25 cents was offered. The latter part of that week buyers were exchanging hampers for cucumbers because there was no demand. Growers who were able to sell their cucumbers during the early part of the month likely made some money, but those having late cucumbers possibly did not clear much above the cost of growing.

The first cantaloupes were shipped from the county July twenty-first, prices were 65 cents for flats and $1.50 for standards. The high prices on cantaloupes reported to date were $1.25 for flats and $3.30 for standards. Prices reported for July 30th were 40 to 85 cents for flats and $1.35 to $2.00 for standards.

Cantaloupes were in many cases stunted and retarded by attacks of aphids. This pest, according to residents in the county was worse than for the past ten years. Entire fields were ruined so that no crop was produced. In other fields the fruit was so discolored that it was unsalable. Three percent nicotine dust has given best control of aphids on cantaloupes. This was applied by a three-row Niagara duster to which a canvas apron was dragged behind the machine and held the dust from blowing away, entirely covering each plant. The kill of aphis was unusually high."

Insecticides of the Future

Scientists in the U. S. Department of Agriculture are turning their attention to the finding of more effective insecticides. The hope of the future seems to lead toward organic poisons. Many of these plant poisons are known to be extremely toxic. As an example David Fairchild describes a tropical plant, Strophanthus sarmentosus, from which the natives extract a virulent poison, strophanthin into which they dip their arrows. It is said that enough of this poison can be carried on the point of a pin to cause death in fifteen minutes. Fortunately many of these plant substances while being extremely toxic to insects are perfectly harmless to human beings. A thorough survey of the possibilities in this direction is to be made. When suitable new insecticides are discovered, there will still remain the problem of producing plants on a commercial scale. This may develop new agricultural crops. The probabilities are, however, that these may be of more interest to tropical or subtropical regions that to the temperature zones.

Vegetable Display

One of the unusual features of the Atlantic City Flower and Garden Pageant to be held September 4 to 10 inclusive will be the vegetable display staged by Sutton and Sons of England. This will occupy 1250 square feet of space. The material for this exhibit is scheduled to arrive in cold storage on the S. S. Mauretania on August 28 in charge of four members of the Sutton organization who will supervise its transportation to Atlantic City and its staging in a manner that promises a new thrill for visitors to the Pageant.

(From the Florists Exchange.)

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VEGETABLE GROWERS' NEWS LETTER

Issued by
The Maryland Vegetable Growers' Association
W. R. Ballard, Secretary-Treasurer

Vol. VIII. No. 10 College Park, Maryland October, 1931.

Bean Culture

Several experiment stations have published bulletins discussing various lines of investigational work with beans. It is only recently, however, that cultural information has appeared in book form. In 1926, Glenn C. Sevey, published a small book, Bean Culture (Orange Judd Co., New York City --$1.00) and this was followed a year later by ome under the same title by E. V. Hardenburg (Macmillan Co., New York City --$3.00) Both books discuss the practical phases of growing and handling beans from a commercial standpoint but with some reference to the home garden.

Operating Economic Units

Recent studies of truck farms in Maryland by the Department of Agricultural Economics reveals the fact that there is a wide variation in the returns from comparable units. A number of factors are involved in the problems and some of these require further study. The results so far indicate that the area involved should not be too small. It may be possible eventually to determine the approximate number of acres necessary to insure an economic unit. The most profitable farms are those not specializing too narrowly nor on the other hand attempting to grow a wide variety of crops. One or two major crops with supporting crops, the production of which do not interfere with operations in connection with the major crops, seems to be the nearest approach to the ideal system. In nearly every case the most efficient farms secure high yields per acre and utilize labor efficiently. A careful analysis of one's business with these factors in mind may be well worth while for any grower of vegetables.

The Ponderosa Tomato

Despite the fact that the Ponderosa type of tomato seems to have little value from a commercial standpoint, it persists in home gardens to a very considerable extent. One reason for this is probably due to the fact that these meaty types have relatively few seeds and consequently low percentages of acid which is found most largely in connection

with the pulp in which the seeds are imbedded. These tomatoes are, therefore, mild in flavor and this evidently appeals to gardners who grow for high quality. Greenhouse tomatoes are also noted for mild flavor.

One of the arguments presented against increasing the tariff on Italian tomatoes was that these are types having less acidity than American grown tomatoes, that they were consumed by Italian people who would not use tomatoes if the Italian product could not be secured.

Consumer demand is a factor in marketing which deserves careful study and more attention will undoubtedly be given to this subject in the near future.

Number, Weight and Shape of Potato Tubers

A recent contribution from the New Jersey Experiment Station and printed in the Journal of Agricultural Research discusses the influence of nitrogen, phosphoric acid, and potash on the number, shape, and weight of potato tubers. The series of experiments extended over a period of four years and included comparisons of 21 different fertilizers. Considering all tubers produced, the greatest number resulted from the use of mixtures low in nitrogen, low to high in phosphoric acid and high in potash. Largest total yields were produced by mixtures having both nitrogen and potassimum in medium to large amounts, the phosphoric acid being present in small amounts. Generally the absence of nitrogen was the most important factor contributing to low yields.

As to shape of tubers, the longest resulted from the presence of ample supplies of moisture although this is believed to be due to making the fertilizer more available rather than to its direct action on the tuber itself.

The widest potatoes resulted from mixtures low to high in nitrogen, low phosphoric acid, and low to high potash. The thickest potatoes followed the above rather closely with perhaps higher potash demands. The quantity of potash present seemed to be chiefly responsible for modifications in the shape of the tuber.

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VEGETABLE GROWERS' NEWS LETTER

Issued by
The Maryland Vegetable Growers' Association
W. R. Ballard, Secretary-Treasurer

Vol. VIII. No. 11 College Park, Md. November, 1931.

Yields of Sweet Potatoes Affected by Length of Root Stems.

In the investigation of factors affecting the yield of sweet potatoes, Mr. Thos. H. White of the Maryland Experiment Station has discovered some facts which should be of particular interest to sweet potato growers. In bedding small roots of the Maryland Golden Big Stem variety one lot was covered with sand one inch deep, the second two inches deep and the third three inches deep. When these plants were drawn the root stems were in direct proportion to the depth of the covering, or one, two and three inches in length. Plots were set with these different types of plants.

After the first frost, sample hills were dug from each of the plots for comparison. The yields from ten hills of one inch stem roots were 40 salable sized roots which weighed 23 pounds and 14 roots weighing 1-1/8 pounds.

The ten hills from the three inch stem roots yielded 25 roots of salable size, weighing 12-1/2 pounds and 10 roots weighing 1 pound.

There was some variation in the rows but the short one-inch root stems gave the highest yield, the medium or two-inch next and the long or three-inch gave the poorest yields.

The difference in yield in favor of the one-inch root stems over the three-inch stems was at the rate of 2260 pounds per acre. Some further studies will be made to discover the causes of this apparent difference in yields, but the results so far indicate that growers should give greater consideration to the way plants are produced.

Maryland Certified Potatoes

The results of the inspection work for 1931 as reported by Extension Plant Pathologist, R. A. Jehle, show that fields of 136 growers of irish potatoes approximating nearly 500 acres and those of nine growers of sweet potatoes approximat-

ing 50 acres, have been certified. All of these growers are eligible to exhibit a selected sample of 32 potatoes at the Potato Show to be held in connection with the annual meetings in Baltimore next January.

Potatoes in many fields this year have been badly affected by diseases so that it will be important next spring to plant certified seed.

A New Fertilizer

A new fertilizing material now on the market seems to have merit particularly for soils lacking in organic content. This is the Sterilized Tobacco Meal manufactured by the Tobacco By-Products and Chemical Corporation of Louisville, Kentucky. The tobacco stems after being stripped are put through a machine which pounds them up into a coarse meal. Height is then applied for the extraction of the nicotine out of which the insecticide, Black Leaf 40 is made. The meal is then bagged and sold for fertilizer. It is reported to contain from 1-1/2 to 2 per cent of nitrogen and from 5 to 6 per cent of potash. The price seems to be low and the material when supplemented with phosphoric acid in the form of super-phosphate has given good results in preliminary trials. Used as a mulch there are indications that sufficient nicotine is left in the meal to act somewhat as a deterrent to insects.

The Oakland Potato Show

The Vegetable Growers' Association cooperated in the holding of a regional potato show at Oakland on the 23rd. and 24th of October. Sixty-seven prizes in all were awarded. The Baltimore and Ohio Railroad provided prizes for thirty classes which were open to growers in a few other states in addition to the Maryland entries. There were twenty-four winners in the certified seed classes. Some of these will undoubtedly be shown again at the annual meetings in Baltimore.

The Corn Ear Worm

Maryland bulletin No. 328 on the above subject is by L. P. Ditman and Ernest N. Cory and was published in June of this year. The authors state: "The corn earworm is rated by Hyslop (1) as the third most important insect pest in the U. S. It is chiefly injurious to corn, cotton, tomatoes and beans. It has been estimated by Phillips (2) that 2% of the value of the field corn crop is lost through the ravages of the corn earworm. In other words, about two million acres of field corn are grown annually to feed the corn earworm. Damage to sweet corn is serious in the central and eastern states and occasionally in the western and northern states. Damage to sweet corn affects the home and market gardener and the canner. Injury to tomatoes is frequently severe and beans are injured, especially late canning and market lima beans, though there are a few records of injury early

in the season to string beans.

Injury by the corn earworm to corn may be directly measured by loss of entire ears or parts of ears through feeding or the combination of feeding and molds, or may take the form of injury beofre tasseling, resulting in a reduction of shelled corn yield, or in labor lost in canneries in the extra operations necessary to cut out the injured portions of the infested ear. The presence of the corn earworm in market corn may result in a reduction in demand.

Summary

Hibernation of the corn earworm in the pupal stage has been definitely ascertained as the method of overwintering in Maryland. Emergence of adults in cages continued from the first of July to the middle of August. In the field emergence is earlier.

Because of the long period of emergence of overwintering earworms, broods during the summer are not distinct. Control must be based on the development of the corn plant rather than on the timing of the broods.

Oviposition was found to be greatest on the corn silks, approximately 70% of the eggs being laid there.

There is considerable mortality in the egg stage; approximately only 50% of all eggs laid were found to hatch.

The time required for young larvae hatching on the silk to enter the ear was found to vary from one-half hour to over two and one-half hours.

The corn earworm apparently may accommodate itself to varying conditions of food by variations in the number of molts; an increase requires a longer period for the larvae to reach maturity.

It was found during the heavy infestation of corn earworm in 1930 that approximately 50% of young ears were infested with young larvae before silking and further that most of these infestations were by young larvae entering through the husk.

The mortality of young larvae hatching on plants before tasseling is high. Probably less than 5% of larvae hatching on young corn plants survive.

Trichogramma minutum Riley was the only insect parasite found attacking the corn earworm at College Park.

Lead arsenate proved to be the most efficient insecticide against the corn earworm. No satisfactory repellents or att-

rahents were found. Dusts were superior to sprays. Aqueous sprays of both contact and stomach poisons proved of no value. De-silking of ears provided some protection from the corn earworm.

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VEGETABLE GROWERS' NEWS LETTER

Issued by
The Maryland Vegetable Growers' Association
W. R. Ballard, Secretary-Treasurer

Vol. VIII. No. 12 College Park, Md. December, 1931.

Mushrooms in Maryland

It will be of interest, perhaps, to note that the 1930 Census reports 12 mushrooms farms in Maryland aggregating 90 acres with land, buildings and equipment valued at $117,729. The square feet of bed surface amounted to 269,896, the value of the houses amounting to $88,979. The total net sales by growers of mushrooms in Maryland amounted to $113,901.

Undoubtedly many mushrooms are collected from meadows and pastures especially in seasons when dry spells are followed by periods of rain.

The Potato Show

It is anticipated that a more representative show of certified seed potatoes will be on exhibit at the Lord Baltimore Hotel next January than was the case at the last annual meeting. In the first place many more growers are eligible to enter samples this year and plans were outlined early enough to acquaint the growers with the opportunity for competing for the honor of winning prizes in a State Show. Maryland is developing a reputation for the quality of its seed stock, due in a large measure, to the strict requirements of the Maryland Certification Board. It should be possible to greatly enlarge this field to the advantage of the seed growers particularly and to all producers of potatoes generally.

The members are invited to inspect the displays of potatoes when placed on exhibit. Both white and sweet potatoes will be included.

Maryland Vegetable Growers' Association

Fourteenth Annual Meeting

Wednesday, January 6, 1931.

(Joint Session with Crop Improvement Association and the Tobacco Growers' Association.)

9:30	Call to order,	J. C. Brown, Pres. Tobacco Gr. Assoc.
	Fertilizer Recommendations under The New State Law,	J. E. Metzger, College Park, Md.
10:00	Crop Rotations and Soil Fertility Problems.	
	(a) For Dairy Farms,	J. W. Magruder, Ellicott City, Md.
	Discussion	
10:40	(b) For Truck and Canning Crops.	H. H. Zimmerley, U. S. D. A.
	Discussion	
11:30	(c) For Tobacco	W. W. Garner, U.S.D.A.
	Discussion	
12:30	Announcements	

Thursday, Jan. 7, 1931.

10:00	Experiments with Sweet Potatoes,	T. H. White, College Park, Md.
	Discussion	
10:45	Some Factors in Modern Vegetable Production,	W. R. Beattie, U. S. D. A.
	Discussion	
11:30	Some Factors Influencing Profits on Maryland Truck Farms,	S. H. DeVault, College Park, Md.
	Discussion	
12:20	Reports of Committees.	